PATENTS
112025-0115

REMARKS

This Amendment is filed in response to the Final Office Action mailed February 6, 2003. Arguments set forth in this amendment supplement those previously presented. All objections and rejections are respectfully traversed. Reconsideration is respectfully requested.

Claim 1 has been amended to change the phrase "said single entity" to "said remote entity," thereby providing a proper antecedent basis as required by 35 U.S.C. §112, second paragraph.

Claims 1-9 and 11 were rejected under 35 U.S.C. §102(e) as anticipated by U.S. Patent No. 6,243,756 to Whitmire et al. ("Whitmire"). Claim 10 was rejected under 35 U.S.C. §103(a) as being obvious over Whitmire in view of U.S. Patent No. 6,092,214 to Quoc et al. ("Quoc"). Claim 11 was rejected under 35 U.S.C. §103(a) as being obvious over Whitmire. Applicants respectfully traverse these rejections.

With regards to claims 1-8, the art of record fails to disclose, among other things, a plurality of switches logically organized in a stack configuration and a separate multiplexer for selectively connecting the switches one at a time to a remote entity, such as a remote monitoring (RMON) probe. The Office Action at paragraph 4 equates the claimed multiplexer with the repeater 102 in Whitmire. However, because the repeater 102 is one of the network switches in a stacked configuration of network switches, it cannot, by definition, also be a multiplexer which is separate from the stacked configuration of network switches, as claimed. See Whitmire, Fig. 1A.

With respect to claims 9-11, the cited art fails to disclose a network switch having a single probe port that connects (i) to other ports in the switch, (ii) to a probe port in at least one other, interconnected switch and (iii) to a remote monitoring probe. The Office Action at paragraph 12 equates the claimed probe port with a communication port 304 in Whitmire. See Col. 11, lines 14-24. However, unlike the claimed probe port, Whitmire's communication port 304 does not connect to a remote monitoring probe. See Fig. 3. Instead, a repeater 102 connects to a remote management platform 116 through a serial port 114, which is different than the repeater's communication port 304. See Fig. 1A. In addition, the claimed invention discloses a single probe port in a network switch, whereas multiple ports 304 are implemented in Whitmire's repeater 102 to interconnect it with the other repeaters 104-110. See Fig. 3.

Description of the Present Invention

The present invention is directed to a system for remotely gathering management information from a plurality of network switches in an efficient manner. The system includes a plurality of network switches organized in a stack arrangement so as to appear as a single, logical switch network. In a first embodiment, each individual switch is coupled to a multiplexer which is also coupled a single, remote monitoring (RMON) probe. The RMON probe, in turn, is connected to a management process. In operation, a first network switch gains control over the multiplexer and utilizes the multiplexer to transmit raw data signals to the RMON probe. The RMON probe receives the raw data and converts it into a format that is usable by the management process. When the first network switch is done transmitting its raw data signals, a second switch gains control over the multiplexer and transits its raw data

signals via the multiplexer to the same RMON probe. The RMON probe converts the raw data signals from the second switch into a format usable by the management process. These steps are repeated such that each individual network switch transmits its raw data signals via the multiplexer to the RMON probe.

In a second embodiment, each individual network switch is provided with a probe port. Each switch's probe port receives switch activity-related information from other ports of the switch. The probe port of a first switch is coupled directly to the RMON probe without utilizing any multiplexer. The remaining switches are then connected, e.g., in series, to the first switch through their respective probe ports. In addition, the first switch selectively, e.g., sequentially, couples each of the individual switches (including itself) one at a time to the RMON probe. The switch that is currently coupled to the RMON probe transmits its switch activity-related information in terms of raw data signals. As with the first embodiment, the raw data signals are converted by the RMON probe into a format that is usable by the management process.

In accordance with the present invention, the network switches do not have any management entities of their own. Instead, the single, remote RMON probe acts as the management entity for all of the network switches. This simplifies the design and reduces the cost of the switches. Furthermore, the single RMON probe can gather raw data signals from each of the plurality of network switches, and convert that raw data into a useful format.

Description of the Cited References

Whitmire is directed to a plurality, e.g., five, repeaters that are incorporated into a single, integrated network device. See Col. 5, lines 34-37 ("a system according to the present

invention provides an internetworking system that operates with segments of different media standards and/or transmission rates in a single integrated device"). The five repeaters are interconnected by a common backplane of the integrated device. See Col. 6, lines 39-40 (repeaters are "physically and logically coupled together across a common backplane bus"). One of the repeaters is designated the management repeater (102), and an SNMP management agent (1302) is disposed on the management repeater (102). See Col. 8, lines 38-40 (the management agent 1302 is "within a management module within the managing repeater 102"). This SNMP management agent (1302), which is disposed within the integrated device itself, collects management information from each of the repeaters. See Col. 23, lines 7-24 (management agent 1302 gathers the statistics for each repeater and organizes the statistics into the format requested by the management platform 116).

Quoc describes a plurality of repeaters organized in a stack. For each repeater, the stack further includes a designated network management module (NMM). One of the NMMs in the stack is selected to be the "master" NMM, while the remaining NMMs are designated as "slave" NMMs. The master NMM performs all of the management functions for the stack, i.e., local monitoring. The slave NMMs remain ready to take over the management functions should the master NMM fail.

Differences Between the Present Invention and the Cited References

Claim 1: Claim 1, as amended, recites in relevant part:

> a plurality of network switches logically organized in a stack configuration so as to operate as a single logical switch;
> an entity remote from the plurality of switches for gathering said information;
> ***a multiplexer separate from the plurality of network switches*** for selectively connecting, according to an arbitration scheme, said plurality of network switches one at a time to said remote entity, wherein

> ***each switch is connected to said multiplexer by a separate connection***, and transmits raw data signals that are converted by the remote entity into network management information. (emphasis added)

In contrast to amended claim 1, Whitmire fails to disclose, among other things, a plurality of switches logically organized in a stack configuration and a separate multiplexer for selectively connecting the switches one at a time to a remote entity, such as a remote monitoring (RMON) probe. The Office Action at paragraph 4 equates the multiplexer in claim 1 with the repeater 102 in Whitmire. However, because the repeater 102 is one of the network switches in a stacked configuration of network switches, it cannot, by definition, also be a multiplexer which is separate from the stacked configuration of network switches, as claimed. See Whitmire, Fig. 1A.

The Office Action relies on Col. 6, lines 38-40 in Whitmire as evidence that the repeater 102 is a multiplexer separate from the other repeaters 104-110. However, the cited portion in Whitmire discloses that the repeater 102 is physically and logically coupled across the backplane bus 112 in the stack configuration 100. See Fig. 1A. In other words, the repeaters and backplane of Whitmire are all physically connected together to form a single device. Moreover, the repeater 102 comprises a two-port switching element 102c that enables communication and data transfer between different network segments connected to the stack configuration. See Col. 7, lines 14-28. Accordingly, the repeater 102 is part of the stack configuration itself, and therefore is not a separate multiplexing device connected to the stack configuration, like the multiplexer in amended claim 1.

For these reasons, the Applicants respectfully urge that amended claim 1 is allowable over Whitmire. Claims 2-8 depend from allowable base claim 1 and are thus also allowable.

Claim 2: Claim 2 recites "A system according to claim 1, ***wherein said entity comprises a remote monitoring probe***" (emphasis added).

At paragraph 5 of the Office Action, claim 2 is rejected based on the assertion that the alleged multiplexer in Whitmire, e.g., repeater 102, comprises a remote monitoring (RMON) probe. However, claim 2 does not recite a multiplexer comprising an RMON probe. Rather, the claim teaches an RMON probe included in a remote entity accessible through a multiplexer. In other words, the rejection is based on an RMON probe in a multiplexer, whereas claim 2 is directed to an RMON probe in a remote entity accessible through a multiplexer.

Therefore, in addition to the reasons previously discussed regarding claim 1, the Applicants respectfully urge that claim 2 is further allowable over the cited art since Whitmire fails to disclose the elements of claim 2.

Claim 9: Claim 9 recites in relevant part:

> a plurality of network switches configured in a stacked configuration, ***each switch having a plurality of ports including a probe port for receiving switch activity-related information from other ports of the respective switch,***
> ***a connection between the probe port of a first network switch to a remote monitoring probe;***
> ***means for interconnecting the network switches through their probe ports;*** and
> means for selectively transmitting the switch activity-related information received at the probe ports in the form of raw data signals to the remote monitoring probe one network switch at a time through the probe port of the first network switch. (emphasis added)

In this embodiment of the invention, a first network switch in a stacked configuration is provided with a dedicated probe port that interconnects the switch to (i) other ports in the switch, (ii) other switches in the stacked configuration and (iii) a remote monitoring probe.

The other switches in the stacked configuration can then utilize their probe ports to transmit raw data signals through the first network switch to the remote monitoring probe.

The Office Action at paragraph 12 equates the probe port in claim 9 with a communication port 304 in Whitmire. See Col. 11, lines 14-24. However, unlike the probe port in claim 9, Whitmire's communication port 304 does not connect to a remote monitoring probe. See Fig. 3. Instead, a repeater 102 connects to a remote management platform 116 through a serial port 114, which is different than the repeater's communication port 304. See Fig. 1A. In addition, claim 9 discloses a single probe port in a network switch, whereas multiple ports 304 are implemented in Whitmire's repeater 102 to interconnect it with the other repeaters 104-110. See Fig. 3.

Accordingly, because Whitmire does not disclose a single probe port that is used to interconnect a network switch to (i) other ports in the switch, (ii) other switches in the stacked configuration and (iii) a remote monitoring probe, the Applicants respectfully urge that claim 9 is allowable in its present form. Claims 10-11 depend from allowable base claim 9 and are thus also allowable for at least the same reasons.

Claim 10: Claim 10 recites "A system according to claim 9, wherein ***said switches are configured to implement an arbitration scheme for determining the order in which the activity-related information of each switch is provided to said probe***" (emphasis added).

The Office Action at paragraph 15 rejects claim 10 as being unpatentable over Whitmire in view of Quoc. More specifically, the Office Action alleges that Whitmire differs from claim 10 because it does not disclose an arbitration scheme for determining the order in which activity-related information of each switch is provided to a remote monitoring probe.

The rejection suggests that Quoc teaches the use of an arbitration scheme as recited in claim 10, and further states that the arbitration scheme in Quoc allegedly would be obvious to combine with the system in Whitmire to avoid data collisions on Whitmire's management bus 112b.

The Applicants respectfully submit that the stacked network switches in Quoc are not connected to a remote monitoring probe. See Quoc, Fig. 2. Therefore, because Quoc does not disclose a remote monitoring probe, there is no apparent reason why one of ordinary skill in the art in possession of Whitmire would be motivated to look to the unrelated network configuration in Quoc to find an arbitration scheme for providing information to a remote monitoring probe, as recited in claim 10. Furthermore, the arbitration scheme taught in the cited portions of Quoc is intended to select a new "master" module for performing management functions for repeaters in a repeater stack. See, for example, Col. 8, lines 9-42. Thus, it is not clear that Quoc's arbitration scheme for selecting a new network management module (NMM) could be successfully implemented for ordering information transmitted to a remote monitoring probe.

Therefore, in addition to the reasons previously discussed regarding claim 9, the Applicants respectfully urge that claim 10 is allowable over the combination of Whitmire and Quoc for at least the foregoing reasons.

Claim 11: Claim 11 recites "A system according to claim 9, wherein ***said probe ports being solely for transmission of said activity-related information***" (emphasis added).

The Office Action at paragraph 17 rejects claim 11 as being unpatentable over Whitmire because Whitmire's Fig. 5 allegedly discloses probe ports 545 used solely for transmis-

sion of switch activity-related information. As explained in Col. 17, line 61 through Col. 18, line 2 in Whitmire, the transceiver 545 is used to couple information from a backplane connector 304 to the backplane bus 112. However, there does not appear to be any disclosure in Whitmire teaching or otherwise suggesting that the information processed by the transceiver 545 is solely switch activity-related information, as recited in claim 11.

Further, it is noted that at paragraph 4 in the Office Action, the claimed probe port is equated to the communication port 304, although at paragraph 17 the claimed probe port is equated to the transceiver 545. In either case, there does not appear to be any disclosure in Whitmire that teaches or otherwise suggests that information transmitted through the communication port 304 or the transceiver 545 is solely switch activity-related information.

Accordingly, in addition to the reasons previously discussed regarding claim 9, the Applicants respectfully urge that claim 11 is allowable over Whitmire for at least the above-noted reasons.

Applicants submit that the application is in condition for allowance and early favorable action is requested.

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